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# sUAS-based Environmental Sampling in Support of High Energy Laser Weapon Systems

Wang, Qing; Yamaguchi, Ryan

Monterey, California: Naval Postgraduate School

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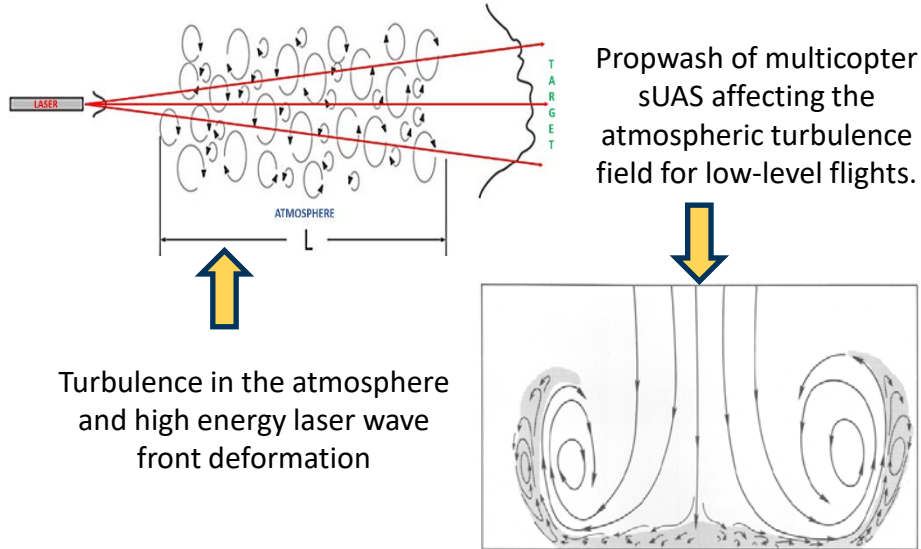


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# sUAS-based Environmental Sampling in Support of High Energy Laser Weapon Systems (HELWS)



## Problem Statement

- We propose developing an optical turbulence sensing capability for multicopter sUAS.
- Differential temperature sensing methods will be adapted to quantifying temperature structure parameters from sUAS. Iterative testing for sensor placement will help mitigate impacts of propwash on turbulence sensing.
- We will identify the potential and limits of using multicopter sUAS for optical scintillation measurements and develop optimal strategies for sampling the undisturbed atmosphere.

## Impact

- The new sUAS-based sampling capability greatly increases the potential of obtaining a large amount of data needed to improve our capacity to predict atmospheric optical turbulence.
- Real time data support are made possible by the sUAS-based measurements in support of HELWS operations.
- The system will be tested against similar measurements from towers and possibly fixed-wing sUAS to ensure the sensor performance and the appropriate sampling strategy.

## Transition

- Sampling of optical turbulence close to the beam director and along the HEL propagation path are critical information to the warfighters for on-scene, short-time performance prediction.
- Continued support may come from multiple sources, e.g., ONR and Joint Directed Energy Transition Office (DEJTO).
- Extensive collaborations with various Navy HELWS test and evaluation programs such as SSL-TM and HELIOS are ongoing and will continue.